1.

#-------------------------------------------------------------------------------

# Name: secondstoyears

# Purpose: To determine whether a baby can expect to live for one billion seconds by converting seconds to years

#

# Author: Clarissa Joyce

#

# Created: 04/09/2014

#-------------------------------------------------------------------------------

#!/usr/bin/env python

ageinseconds = input("How many seconds? ")

sectomin = 1/60.

mintohour = 1/60.

hourtoday = 1/24.

daytoyear = 1/365.

ageinyears = ageinseconds \* sectomin \* mintohour \* hourtoday \* daytoyear

if (ageinyears<= 100) :

liveordie = ""

else :

liveordie=" not"

print "Baby will be "+ repr(ageinyears) +" years old in " + repr(ageinseconds)+" seconds."

print "The baby would" + liveordie+ " be expected to live for "+ repr(ageinseconds) + " seconds."

2.

#-------------------------------------------------------------------------------

# Name: interest

# Purpose: to calculate the value of a bank account after a given amount of years

#

# Author: Claire Joyce

#

# Created: 08/09/2014

#-------------------------------------------------------------------------------

#!/usr/bin/env python

origval = 1000

interestperyear = 0.025

n = [5,10,30]

newval = origval\*(1+interestperyear)\*\*n[0]

print "The account value after " + repr(n[0]) + " years is $"+ repr(newval) +"."

newval = newval\*(1+interestperyear)\*\*n[1]

print "The account value after " + repr(n[1]) + " years is $"+ repr(newval) +"."

newval = newval\*(1+interestperyear)\*\*n[2]

print "The account value after " + repr(n[2]) + " years is $"+ repr(newval) +"."

3.

#-------------------------------------------------------------------------------

# Name: Problem3

# Purpose:

#

# Author: Claire Joyce

#

# Created: 08/09/2014

#-------------------------------------------------------------------------------

#!/usr/bin/env python

V0=3

t=2

a=2

x=V0\*t

x+=(1./2)\*a\*t\*\*2 # python is case sensitive, so this v0 must be capitalized

print a

print x # from the original problem, python gets x=6, when the answer should be ten.

# this is because the fraction 1/2 is not interpreted correctly by python.

# The numbers must be given float values to be used

4.

#-------------------------------------------------------------------------------

# Name: quadratic

# Purpose:

#

# Author: Claire Joyce

#

# Created: 08/09/2014

#-------------------------------------------------------------------------------

#!/usr/bin/env python

a=2; b=1; c=2

from math import sqrt

import cmath

q=sqrt(abs(b\*b - 4\*a\*c))

x1 = (-b+q)/2\*a

x2 = (-b-q)/2\*a

print x1,x2

#the program did not support complex numbers, fixed using abs

5.

#-------------------------------------------------------------------------------

# Name: sinesum

# Purpose: to calculate the value of sin(s) using a series and compute the error using the sine method from math

#

# Author: Claire

#

# Created: 08/09/2014

#-------------------------------------------------------------------------------

#!/usr/bin/env python

from math import \*

from numpy import \*

from math import pi

x=input("enter value of x in degrees:")

x= x\*pi/180

n=input("number terms to calculate:")

sine1 = math.sin(x)

print sine1

sum=0

for n in range(0,n+1,1):

sum =sum +(((-1)\*\*n)\*((x\*\*n)/math.factorial(n)))

print sum

error = ((sine1-sum)/sine1)

print "error:", error

6.

Operations done by hand

7.

#-------------------------------------------------------------------------------

# Name: fibonacci

# Purpose:

#

# Author: Claire Joyce

#

# Created: 11/09/2014

#-------------------------------------------------------------------------------

#!/usr/bin/env python

n=0

list = [0,1]

while n<3:

n= input("Pick a number greater than 2 for the number of terms")

for i in range(0,n):

new =list[len(list)-1] + list[len(list)-2]

list.append(new)

print list

8.

#-------------------------------------------------------------------------------

# Name: quantumparticles

# Purpose:

#

# Author: Claire Joyce

#

# Created: 10/09/2014

#-------------------------------------------------------------------------------

#!/usr/bin/env python

list=[]

for n1 in range(1,11,1):

for n2 in range (1,11,1):

for n3 in range (1,11,1):

E= n1\*\*2 + n2\*\*2 + n3\*\*2

list.append(E)

list.sort()

print list

9.

#-------------------------------------------------------------------------------

# Name: collatz

# Purpose:

#

# Author: Claire Joyce

#

# Created: 10/09/2014

#-------------------------------------------------------------------------------

#!/usr/bin/env python

from math import \*

from scipy import \*

from numpy import \*

n=input("natural number:")

for i in range(0,20):

while n!=1:

if n%2 ==0:n=n/2

else: n= 3\*n+1

print n